

REMARKS

The present amendment is submitted in response to the Office Action received from the United States Patent Office dated December 28, 2007. In the Office Action, the Patent Office rejected Claims 1 and 2 under 35 U.S.C. §102(b) as being anticipated by *Murakami et al* JP 57-35,925 A. Additionally, Claims 1 and 2 are rejected under 35 U.S.C. §102(b) as being anticipated by *Takeuchi et al.* Additionally the Patent Office rejected Claims 1-16 under 35 U.S.C. §103(a) as being unpatentable over *Takeuchi et al.* (JP 55-139,819). Moreover, the Patent Office rejected Claims 8-19 under 35 U.S.C. §103(a) as being unpatentable over *Evans et al.* (U.S. Patent No. 6,210,154) in view of *Takeuchi et al.* (JP 55-139,819 A). The Patent Office further rejected Claims 17-19 under 35 U.S.C. §101 as claiming the same invention as that of Claims 17-19 of copending Application No.: 11/949,628 and Claims 10-19 over the same application.

The Patent Office rejected Claims 1 and 2 under 35 U.S.C. §102(b) as being anticipated by *Murakami et al* JP 57-35,925 A. The Patent Office states that the English abstract of JP-925 sets forth that the NO_x contained in the exhaust gas emitted from a coal combustion process is reduced by reaction with pulverized coal injected into the exhaust gas. The NO_x is reduced by the hydrocarbons, ammonia and cyanide generated from the pulverized coal. Paragraph section no. 6 on pg. 2 in the text of JP-925 seems to teach that the reaction between the NO_x and the chemical agents occur at a temperature as low as 900 °C (1,652 °F).

Claims 1 and 2 are rejected under 35 U.S.C. §102(b) as being anticipated by *Takeuchi et al* JP 55-139819 A. The Patent Office states that paragraph no. 4 on pg. 2 within the text of JP-819 appears to describe a prior art process for removing NO_x out of an exhaust gases via reaction hydrogen cyanide at a temperature below 1,400 °C (2,552 °F).

However, both Claim 1 and 2 have been cancelled. The rejection is moot over the cancelled claims. Notice to that effect is requested.

The Patent Office rejected Claims 1-16 under 35 U.S.C. §103(a) as being unpatentable over the English translation of JP 55-139,819A. The Patent Office states that Claim 1 in the English translation of JP-819 discloses a process for removing cyanide and nitrogen oxides from

waste gas by contacting the waste gas with a catalyst at an elevated temperature. Pg. 12, 2nd full paragraph in the English translation of JP-819 sets forth that if the waste gas contains nitrogen oxides alone, then cyanides can be added to the waste gas. Pg. 7, 1st full paragraph in the English translation of JP-819 sets forth that reaction temperatures of 450 °C (842 °F) or lower may be used.

The difference between the Applicants' claims and JP 55-139, 819 A is that the Applicants' claims call for the injection of a waste which contains the cyanide, whereas JP 55-139, 819 A seems to allude to the injection of cyanide alone on pg. 12, 2nd full paragraph in the English translation of JP-819, *however*, it is submitted that this difference would have been obvious to one of ordinary skill in the art at the time the invention was made *because* one skilled in the art would have a "reasonable expectation of success" of using any material that contains cyanide, such as the "cyanides" mentioned on pg. 12 in the English translation of JP-819 or the cyanide-containing waste of the Applicants' claims: please note the discussion of the *In re Merck & Co. Inc.* 800 F.2d 1091, 231 USPQ 375 (fed. Cir. 1986) court decision set forth in section 2143.02(l) in the MPEP. No criticality or unexpected advantages are seen in using a cyanide-containing waste as compared to any other source of cyanide.

Applicant understands and respects the Patent Office argument but respectfully disagrees. Applicant respectfully requests that the Patent Office reconsider the rejection and withdraw the rejection because of the arguments that follow.

The Japanese '819 patent relates to the process of purifying a gas containing cyanides and nitrogen oxides. The gas in the '819 includes cyanides and nitrogen oxides in combination. Applicant was unable to find a reference where nitrogen oxide and cyanide are actually mixed together. The gas containing cyanide and nitrogen oxides is referred to as waste gas, which also contains oxygen in quantity. However, the prior art reference requires this gaseous waste matter to be used in conjunction with a catalyst such as chromium, copper oxide and/or titanium oxide. It is this catalyst that allows for the purification of the waste gas and not the addition of the cyanide as represented in the present invention.

Additionally, in reference to Claim 1, the prior art references requires that the process of purifying relates to purification of a gas already containing both cyanides and nitrogen oxides.

The mixture is already in combination, and the elements are not separately mixed to effectuate the purification process are required by the present invention. Additionally, the claims of the Takeuchi et al. reference require “a catalyst that contains chromium or copper oxide and titanium oxide as the principal active components.”

Amended Claim 3 requires a method of reducing nitrogen oxides from an air stream, comprising: directly introducing cyanide into the air stream at a temperature between 1200° degree F and 1700° degree F; and reacting the cyanide with the nitrogen oxides wherein the reacting step occurs at a temperature between 1200° degree F. and 1640° degree F, and further wherein the cyanide is contained in a waste material.

The requirement of adding cyanide into the air stream that contains a nitrogen oxide is nowhere contained in *Takeuchi et al.* Moreover, the present invention does not require any additional element and/or specifically, a catalyst to effectuate the method of reducing the nitrogen oxide from an air stream as required by *Takeuchi et al.* Fundamentally, this is a major different. A person of ordinary skill in the art would not be motivated to remove the catalyst from *Takeuchi et al.* to come up with the present invention, as *Takeuchi et al.* requires the catalyst in as the principal active components. This necessary element is absent in the present invention and would not obviate the elements disclosed in the present invention.

If is further submitted that the question under §103 is whether the totality of the art would collectively suggest the claimed invention to one of ordinary skill in this art. In re Simon, 461 F.2d 1387, 174 USPQ 114 (CCPA 1972).

The elements, even distinguishing elements, are disclosed in the art is alone insufficient. It is common to find elements somewhere in the art. Moreover, most if not all elements perform their ordained and expected functions. The test is whether the invention as a whole, in light of the teaching of the reference, would have been obvious to one of ordinary skill in the art at the time the invention was made. *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983).

It is insufficient that the art disclosed components of Applicant's invention. A teaching, suggestion, or incentive must exist to make the combination made by Applicants. Interconnect Planning Corp. v. Feil, 774 F.2d 1132, 1143, 227 USPQ 543, 551 (Fed. Cir. 1988).

In view of the foregoing remarks and amendments, the rejection of Claims 1-19 under 35 U.S.C. §103(a) as being unpatentable over *Takeuchi et al.* has been overcome and should be withdrawn. Notice to that effect is requested.

The Patent Office further rejected Claims 8-19 under U.S.C. §103(a) as being unpatentable over *Evans et al.* (U.S. Patent No. 6,210,154) in view of the English translation of JP 55-139,819 A to *Takeuchi et al.* The Patent Office states that the English abstract of *Evans et al.* describes a method and apparatus for removing nitrogen oxides emitted from a cement manufacturing plant that comprises a kiln and a Lepol pre-heater, by injecting the NOx-reducing agent (i.e. waste tires) into the pre-heater. The Patent Office further states that the difference between the Applicants' claims and *Evans et al.* is that Applicants' claims call for using a cyanide-containing waste as the NOx reductant at a temperature ranging from 1,200 to 1,700 °F. The Patent Office states that Claim 1 in the English translation of JP-819 discloses a process for removing cyanide and nitrogen oxides from a waste gas by contacting the waste gas with a catalyst at an elevated temperature. Pg. 12, 2nd full paragraph in the English translation of JP-819 sets forth that if the waste gas contains nitrogen oxides alone, then cyanides can be added to the waste gas. Pg. 7, 1st full paragraph in the English translation of JP-819 sets forth that reaction temperatures of 450 °C (842 °F) or lower may be used. The difference between the process described in the invention of JP-819 and the Applicants' claims is that the process of JP-819 conducts the denitration at a temperature of 450 °C or less (i.e. 842 °F or less) whereas the Applicants' claims call for conducting the denitration at a temperature of 1,200 to 1,700 °F, *however* it is submitted that this difference would have been obvious to one of ordinary skill in the art at the time the invention was made because pg. 4, 2nd full paragraph in the English translation of JP-819 discloses a similar reaction between nitrogen oxides and cyanide at temperatures of 1,400 °C or below and the courts have already determined that the overlapping portion of a claimed range and a prior art reference's range is *prima facie* obvious: please note the discussion of the *In re Wertheim* 541 F.2d 257, 191 USPQ 90 (CCPA 1976) court decision set forth in section 2144.05(l) in the MPEP.

Therefore, the Patent Office reasons, that it would have been obvious to one of ordinary skill in the art at the time the invention was made *to have modified* the process and apparatus described in the Evans et al. patent *by substituting* the cyanide-containing waste obvious from JP-819 *in lieu* of the waste tires used in the process and apparatus of the Evans et al. patent into the process and apparatus of the Evans et al. patent, in the manner required by the Applicants' claims, *because* the courts have already determined that such substitution of one known functional equivalent in lieu of another known functional equivalent (both of which are useful for the same purpose) is prima facie obvious: please note the discussion of *In re Fout* 675 F.2d 297, 213 USPQ 532 (CCPA 1982) court decision set forth in section 2144.06(II) in the MPEP.

Evans et al. discloses an emission of nitrogen oxides from a mineral-burning process, that may be reduced by passing the exhaust gas from the rotary kiln in which the mineral raw materials are burnt to a combustion zone in which solid fuel elements. *Evans et al.* discloses that at least 30% by weight of the volatile combustible content of the solid fuel elements are combusted, the combustion zone comprising at least one region in which the combustion of the solid fuel elements occurs under sub-stoichiometric conditions. The solid fuel elements may be introduced into the hot gas stream at least one point between the mineral-inlet end of the rotary kiln and the lowermost cyclone of an associated preheater system.

As stated above *Takeuchi et al.* relates to the process of purifying a gas containing cyanides and nitrogen oxides. The gas in *Takeuchi et al.* includes cyanides and nitrogen oxides in combination. Applicant was unable to find a reference where nitrogen oxide and cyanide are actually mixed together as separate entities to purify the waste gas as required by the present invention. On the contrary, the *Takeuchi et al.* reference stipulates that the gases are in mixture and are the necessary catalyst is required to begin the process of purification. The gas containing cyanide and nitrogen oxides is referred to as waste gas, which also contains oxygen in quantity. However, the prior art reference requires this gaseous waste matter to be used in conjunction with a catalyst such as chromium, copper oxide and/or titanium oxide. It is this catalyst that allows for the purification of the waste gas and not the addition of the cyanide as represented in the present invention.

If is further submitted that the question under §103 is whether the totality of the art would collectively suggest the claimed invention to one of ordinary skill in this art. In re Simon, 461 F.2d 1387, 174 USPQ 114 (CCPA 1972).

The elements, even distinguishing elements, are disclosed in the art is alone insufficient. It is common to find elements somewhere in the art. Moreover, most if not all elements perform their ordained and expected functions. The test is whether the invention as a whole, in light of the teaching of the reference, would have been obvious to one of ordinary skill in the art at the time the invention was made. Connell v. Sears, Roebuck & Co., 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983).

It is insufficient that the art disclosed components of Applicant's invention. A teaching, suggestion, or incentive must exist to make the combination made by Applicants. Interconnect Planning Corp. v. Feil, 774 F.2d 1132, 1143, 227 USPQ 543, 551 (Fed. Cir. 1988).

In view of the foregoing remarks and amendments, the rejection of Claims 8-19 under 35 U.S.C. §103(a) as being unpatentable over *Evans et al.* in view of *Takeuchi et al.* has been overcome and should be withdrawn. Notice to that effect is requested.

The Patent Office rejected Claims 17-19 under 35 U.S.C. 101 as claiming the same invention as that of claims 17-19 of copending Application No. 11-949,628. This rejection was a provisional double patenting rejection since the conflicting claims have not in fact been patented. Additionally, the Patent Office rejected Claims 1-19 on the grounds of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-19 of copending Application No. 11-949,628. The Patent Office states that although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of 10-507,146 and 11-949,628 describe obvious variations of the same process for reducing nitrogen oxides from an air stream by injecting cyanide into the air stream and allowing the cyanide to react with the nitrogen oxides.

The difference between the claims of 10-507,146 and 11-949,628 is that claim 1 in 10-507,146 set forth that the cyanide is introduced into the air stream at a temperature ranging from 1200 to 1700 °F.

Claim 2 in 11-949,628 sets forth that the reaction step occurs at a temperature between 1200 and 1640 °F.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have set forth that claim 1 in 11/949,628 calls for injecting the cyanide into the air stream at a temperature ranging from 1200 to 1700 °F, in the manner set forth in claim 1 in 10/507,146, because claim 2 in 11/949,628 fairly teaches this claimed temperature range.

Enclosed is a Terminal Disclaimer for the double patenting rejection. The Commissioner is hereby authorized to deduct the filing fees due in connection with this Terminal Disclaimer from Deposit Account No. 50-2191.

In view of the forgoing remarks, Applicant respectfully submits that all of the claims in the application are in allowable form and that the application is now in condition for allowance. If any outstanding issues remain, Applicant urges the Patent Office to telephone Applicant's attorney so that the same may be resolved and the application expedited to issue. Applicant requests the Patent Office to indicate all claims as allowable and to pass the application to issue.

Respectfully submitted,

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Date: March 27, 2008

By

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